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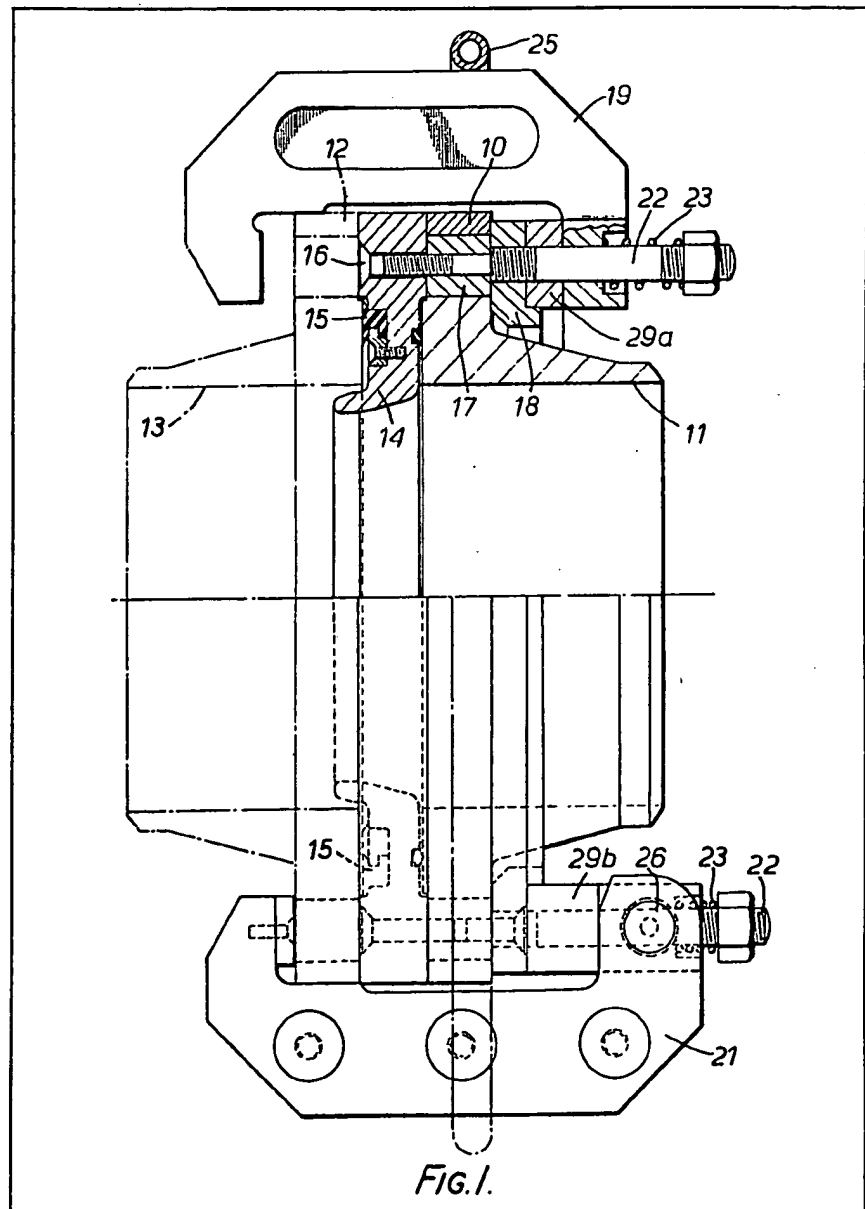
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(54) Pipe couplings

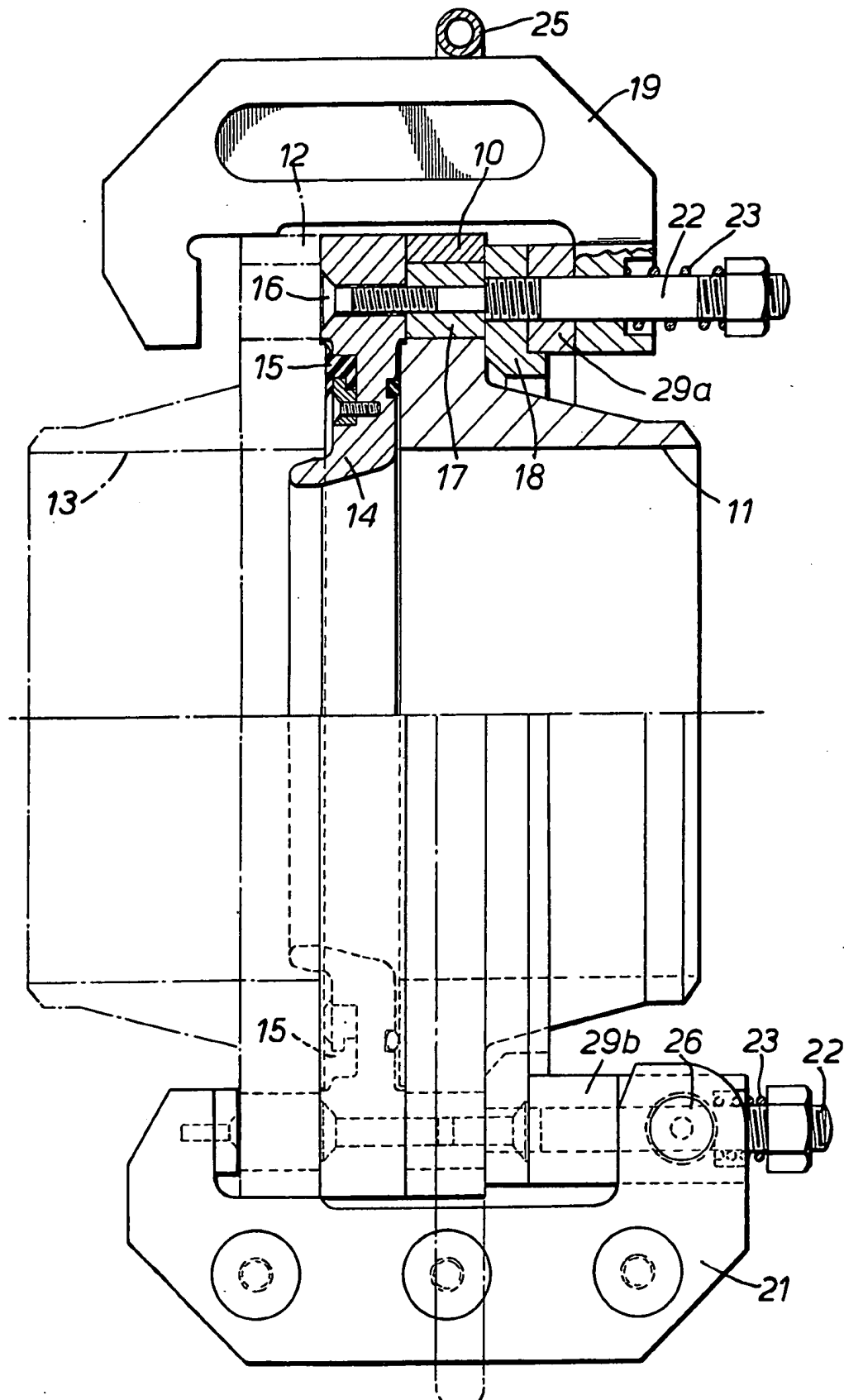
(57) A pipe coupling comprising plate means 18 for attachment to a pipe flange 10, the plate means carrying at least three longitudinally movable clamping hooks, 19, 20 and 21. At least one of the clamping hooks 21 is

hinged for radial movement to allow location of a further pipe flange in abutment with the coupling. A cam ring 29 has a cam surface for each clamping hook, rotary movement of the cam ring being arranged to cause the longitudinal movement of the clamping hooks for clamping to the further pipe flange.



GB 2 098 295 A

1/3



2/3

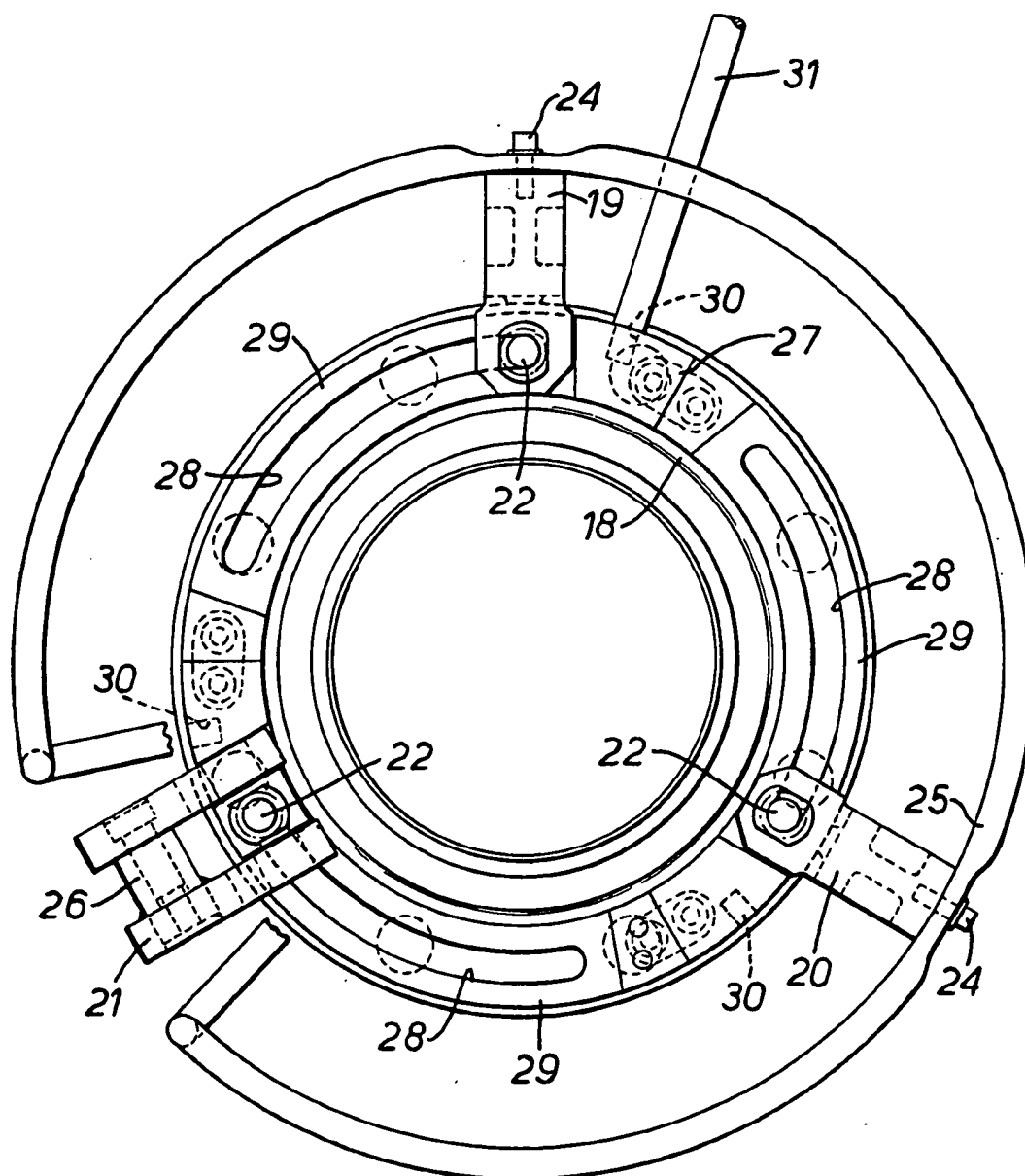


FIG. 2.

3/3

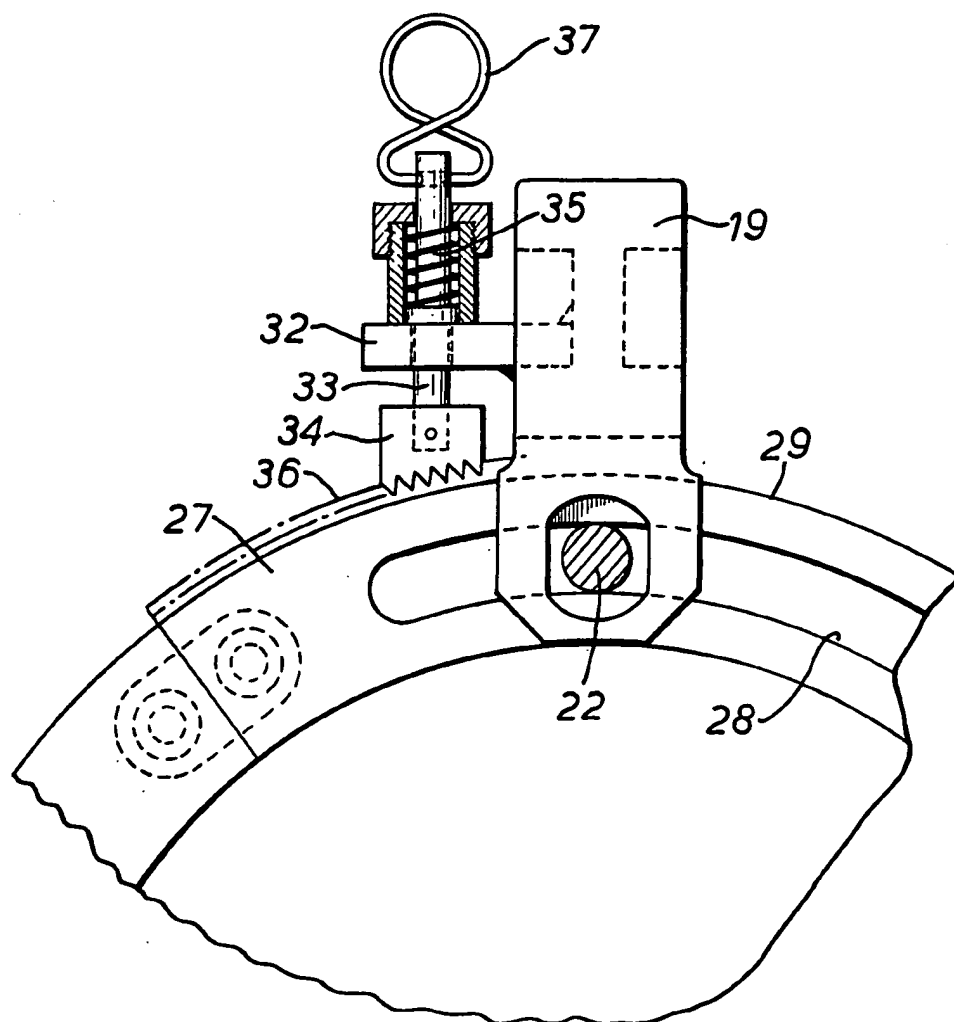


FIG. 3.

SPECIFICATION

Improvements in and relating to pipe couplings

The invention relates to pipe couplings and more particularly, although not exclusively, to such couplings which are light in weight and provide a quick connecting mechanism to replace the standard bolted pipe flange.

According to the invention there is provided a pipe coupling comprising plate means for attachment to a pipe flange, the plate means carrying at least three longitudinally movable clamping hooks, at least one of the clamping hooks being hinged for radial movement to allow location of a further pipe flange in abutment with the coupling, and a cam ring which has a cam surface for each clamping hook, rotary movement of the cam ring being arranged to cause the longitudinal movement of the clamping hooks for clamping to said further pipe flange.

Preferably the clamping hooks are resiliently urged towards their unclamped positions.

The cam ring may be manually rotatable or may be power operated, for example by an hydraulic ram or a motor. A ratchet means may be provided for locking the cam ring in position when the clamping hooks are in the clamped position.

The plate means may comprise a pair of plates for location on either side of a pipe flange, the plates being retained by spool pieces located in the bolt holes of the pipe flange.

The foregoing and further features of the invention may be more readily understood from the following description of a preferred embodiment thereof, by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is a side sectional view of a pipe coupling

Fig. 2 is an end elevational view of the pipe coupling of Fig. 1 and

Fig. 3 is an end elevational view of a locking ratchet mechanism for use with the pipe coupling of Fig. 1 and 2.

Referring now to the drawings, there is shown a coupling for attaching to the flange 10 of a first pipe 11 for clamping to the flange 12 of a second pipe 13. The coupling comprises a face plate 14, with an annular lip seal 15 located thereon which is attached to the outer face of flange 10 by screws 16 which locate in spool pieces 17 carried on a back plate 18 located on the rear face of flange 10 with the spool pieces 17 located in the normal bolt holes of such flange 10.

Three clamping hooks, 19, 20 and 21 are carried on the back plate 18 equidistantly spaced therearound. Each of the clamping hooks is attached to the back plate 18 by a respective spindle 22 to allow longitudinal clamping motion of the clamping hook, respective springs 23 being located on the spindles 22 to normally urge the clamping hooks to their unclamped or retracted positions. The clamping hooks 19 and 20 are attached by screws 24 to an annular member 25 which prevents radial movement of such clamping hooks 19 and 20 and

member for handling the coupling. The clamping hook 21 is additionally mounted for radial movement about a spindle 26.

Located between the rear face of back plate 18 and each of the clamping hooks, 19, 20 and 21 is a cam ring 27 formed with slots 28 through which engage the spindles 22. The cam ring 27 is formed with a camming surface 29 for each of the clamping hooks. The cam ring 27 is formed with three apertures 30 for the engagement of a tommy bar 31, in any one thereof, to enable manual rotational movement of the cam ring 27.

In Fig. 1 the clamping hook 19 is shown in the unclamped position with spring 23 urging such clamping hook 19 away from flange 12 and the camming surface portion 29a being at its narrowest profile. Conversely clamping hook 21 is shown in the clamped position with spring 23 compressed and the camming surface portion 29b being at its highest profile to locate the clamping hook against flange 12.

In use of the device with all the clamping hooks 19, 20 and 21 being in the retracted position and the clamping hook 21 radially hinged outwardly about spindle 26, the flange 12 is located beneath the clamping hooks 19 and 20 and the clamping hook 21 rotated back to its position parallel with the pipe. The camming ring 27 is then moved in a clockwise direction by use of the tommy bar 31 so that the cam tracks run between the clamping hooks and the back plate to clamp flange 12. Conversely to release the coupling, the tommy bar 31 is moved in a counter clockwise direction to allow the springs 23 to release the clamping hooks from flange 12, the clamping hook 21 is then hinged outwardly to allow flange 12 to be removed from the coupling.

In order to provide a locking action for the coupling a ratchet mechanism may be attached to the hook 19 as shown in Figure 3. The ratchet mechanism comprises a bracket 32 attached to clamping hook 19 formed with an aperture through which the ratchet spindle 33 passes, carrying a ratchet member 34 at the end thereof and spring loaded by a spring 35. The ratchet member 34 engages within teeth 35 formed on the cam ring 27. With actuation of the tommy bar 31 to rotate the cam ring 27 the ratchet member 34 moves along the teeth in normal fashion and locks the cam ring 27 in the clamped position. To release the device the spindle 33 is retracted by a handle member 37 against the action of the spring 35 so that the clamping ring can be rotated to the open position.

The arrangement shown should be of minimum weight and therefore one or more of the major parts may be made from fibre of powder filled nylon, resin bonded, fibre glass or carbon fibres, as an alternative to ferrous and non-ferrous metals. More than one of the clamping hooks may be hinged for radial movement depending upon requirements for the coupling.

CLAIMS

1. A pipe coupling comprising plate means for

- attachment to a pipe flange, the plate means carrying at least three longitudinally movable clamping hooks, at least one of the clamping hooks being hinged for radial movement to allow
- 5 location of a further pipe flange in abutment with the coupling, and a cam ring which has a cam surface for each clamping hook, rotary movement of the cam ring being arranged to cause the longitudinal movement of the clamping hooks for
- 10 clamping to said further pipe flange.
2. A pipe coupling as claimed in claim 1 wherein the clamping hooks are resiliently urged towards their unclamped positions.
3. A pipe coupling as claimed in claim 1 or 2
- 15 wherein the cam ring is rotatable manually.
4. A pipe coupling as claimed in claim 1 or 2 wherein the cam ring is power operated.
5. A pipe coupling as claimed in claim 4 wherein the cam ring is actuated by an hydraulic
- 20 ram.
6. A pipe coupling as claimed in claim 4 wherein the cam ring is actuated by a motor.
7. A pipe coupling as claimed in any preceding claim wherein a ratchet means is provided for
- 25 locking the cam ring in position when the clamping hooks are in the clamped position.
8. A pipe coupling as claimed in any preceding claim wherein the plate means comprises a pair of plates for location on either side of a pipe flange, the plates being retained by spool pieces located
- 30 in the bolt holes of the pipe flange.
9. A pipe coupling substantially as hereinbefore described with reference to the accompanying drawings.

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